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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
GARCIA OTERO, EDUARDO

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/333,379	HAGENBUCH ET AL.	
	Examiner	Art Unit	
	Eduardo Garcia-Otero	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *13, 16* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION: First Action (after RCE)

Introduction

1. Title is: PROCESS FOR THREE-DIMENSIONAL MODELING AND DESIGN OF OFF-HIGHWAY DUMP BODIES
2. First named Inventor is: HABENBUCH
3. Claims 1-60 are pending.
4. The Amendment received 6/17/03 amends claims 18 and 31, and adds new claim 60.
5. The Examiner appreciates the additional IDS. It appears that several competitors are marketing products that are, at the minimum, very similar to the present Application. However, the IDS publication dates are after the 6/15/99 filing date of the present Application, and thus are not prior art.

Applicant's REMARKS

6. ENABLEMENT AND INDEFINITENESS. Remarks page 12-14. The Examiner withdraws all pending 35 USC 112 rejections, due to Applicant's persuasive assertions and amendments.
7. PRIOR ART. Remarks page 14-16. Applicant unpersuasively asserts that the prior art does not apply.
8. **Claim 1 (previously amended) step (f) states,** in full, "developing a three dimensional volumetric model of a load to be carried in the body defined by the initial floor line, the initial front wall line and the initial inside body width using the data collected from the anticipated point of use with the three dimensional volumetric model having a volume and a volumetric model center of gravity located on the chassis".
9. **Caterpillar Release N149F states** "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate the published figures for the 769B."
10. MATERIAL DENSITY. Applicant unpersuasively asserts that Caterpillar N149F refers to only to "*weight* distribution and *weight* studies, and not a three dimensional *volumetric* load model as called for in the claims... no reference to material density." Italics in original.

Note that Caterpillar uses the terms "loading techniques and material characteristics". Important, and well known, mining material characteristics include density. Further note that the Caterpillar states that these "weight studies... [indicate that] normal load shapes are actually closer to a 1.7:1 heaped load shape". Thus, Caterpillar apparently uses the term "weight studies" in a broad sense which includes load shapes, and related factors such as density and volume.

11. Applicant is correct that Caterpillar makes no explicit reference to material density. However, one of ordinary skill in the art would understand that the term "material characteristics" includes density, particularly in the context of weight distributions and volumetric shapes.
12. DESIRED VOLUMETRIC CAPACITY. Applicant is correct that Caterpillar does not expressly teach the step of determining a desired volumetric capacity for the body as in step (d). However, please note that Hagenbuch'914 (and not Caterpillar) is used to disclose step (d) in Claim 1.
13. Applicant states that Caterpillar page 7 shows the weight distribution for "hauling a 1.7:1 heaped load", and Applicant contrasts this with "same Caterpillar brochure uses the standard 2:1 SAE model as shown on page 3". Applicant unpersuasively concludes that Caterpillar did not use those weight studies to design the volumetric capacity of the 769 B body. There is another, more likely explanation for Caterpillar's reference to the SAE model.
14. Note that the "standard" 2:1 SAE model is exactly what the Applicant calls it, an SAE "standard" model. While Caterpillar does reference the standard model at page 3, the Applicant admits that "page 7 of the Caterpillar brochure... weight distribution on the front and rear axles... is hauling a 1.7:1 heaped load". Thus, Caterpillar discloses a relationship between weight distribution and load shape, and that relationship includes density. See MPEP 2144.01 on implicit disclosure.
15. Additionally, despite using the 1.7:1 empirical model at page 7, Caterpillar includes the "standard" SAE model at page 3 in the brochure for other purposes. For example, the standard SAE model may serve as a rough index for comparing volumetric capacities of different models of trucks. Note that the SAE brochure J1363 NOV95 states "1.1 Purpose—

The purpose of this document is to provide a uniform method for calculating the SAE rated volumetric capacity".

16. As a second example, the SAE model may be useful to customers who use it as a starting point for their own local and customized calculations, for example applying a correction factor to account for the special characteristics of their own materials and loading techniques. During the interview of 11/25/02, Mr. Hagenbuch stated that some mining companies in South America (copper mines in Peru) applied a 0.9 "local correction factor" to the SAE ratings.
17. **In conclusion, Caterpillar's use of the standard SAE model (for comparison purposes or correction factor purposes) did not prevent Caterpillar from using its own more detailed empirical models for design purposes including weight distribution.** It appears that the SAE model is used after the design is completed in order to calculate a standard SAE volumetric capacity.
18. VARYING MATERAL DENSITIES. Remarks page 16. Applicant correctly asserts that there is no evidence that Caterpillar used "varying material densities". Rather, Caterpillar appears to use an average 1.7:1 heaped load shape with an average material density to calculate the axle weight distribution. However, Caterpillar does appear to be aware of varying material densities, as indicated by the term "field weight distribution will vary, depending upon loading techniques and material characteristics...".
19. Applicant is correct that Caterpillar does not mention "determining a desired volumetric capacity for the body" which is step (d) of Claim 1. However, Hagenbuch'914 is used to disclose step (d). Additionally, it is not clear precisely what factor Caterpillar uses as a desired capacity for its design, but it appears to be weight. If the Caterpillar's desired capacity is weight, and if Caterpillar uses an empirical average material density, then that is equivalent to a desired capacity in volume. Design weight and design volume are related by density. Each factor may be determined by the other two factors.
20. IN RE REINHART. Remarks page 16-17. First, Applicant persuasively asserts that the Claim 1 (previously amended) obviousness rejection is "multi-layered". However, merely being multi-layered does not make an obviousness rejection inadequate. In fact, *In re Reinhart*, 531 F.2d 1048, 1953, 189 USPQ 143, (CCPA 1976) is actually a "multi-layered"

obviousness case where two separate items of prior art ("Pengilly" and "Munro") are combined and then commercially scaled. Said combination and scaling was held to be obvious.

21. The confusion regarding interpretation of *In re Rinehart* appears to stem from the quotation in the MPEP 2144.04(IV)(A) which states "mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled", citing *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976). However, a close reading of the facts of *In re Reinhart* disclose that the obviousness rejection is "multi-layered" because it relies upon two separate items of prior art ("Pengilly" and "Munro") and then scaling the process created by combining Pengilly and Munro. Perhaps, in the Examiner's opinion, it would be more clear to characterize *In re Rinehart* as "combining and then scaling", rather than as merely scaling. See also MPEP 2144 and MPEP 2144.04.
22. Thus, the "multi-layered" (combining and then scaling) obviousness rejection of Claim 1 (previously amended) appears to be precisely the type of rejection that is supported by *In re Rinehart*.
23. MOTIVATION. Remarks page 17-18. Applicant unpersuasively asserts that the motivation to combine is based upon improper hindsight. Because motivation is important, the Examiner will discuss the motivation in greater detail. The Examiner will expand the motivation section of Claim 1 (previously amended) to specifically address some of Applicant's assertions (which have not been addressed above). See rejections below.
24. CONE SHAPES AND TRUNCATED CONE SHAPES--MOTIVATION. Remarks page 18, claims 31 and 44. Applicant correctly states that the Examiner "has not identified any motivation in the prior art for using such shapes in a three dimensional volumetric load model to design a body". However, identification of motivation in the prior art is not mandatory.
25. MPEP 706(j) states "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings... To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly

or impliedly suggest the claimed invention **or the examiner must present a convincing line of reasoning** as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Emphasis added. Citing Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). See also MPEP § 2144 - § 2144.09 for examples of reasoning supporting obviousness rejections.

26. Thus, the standard for motivation is "either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning", according to MPEP 707(j).

27. The Applicant has unsuccessfully addressed the legal adequacy of the motivation (on the basis of lack of suggestion in the references). The applicant has not addressed the logical adequacy of the Examiner's reasoning in the "convincing line of reasoning". Therefore, the motivation appears adequate, and is maintained.

28. ERROR IN REJECTION OF CLAIM 39. Applicant persuasively states that the rejection of claim 39 appears to be an error because it repeats the rejection used for Claim 31. A new rejection is provided below for claim 39. Note that limitation (e) is treated as two parts: (e-part 1) and (e-part 2).

29. SIGNIFICANT COMMERCIAL SUCCESS (SECONDARY CONSIDERATIONS). At the interview of 11/25/02, Applicant asserted significant commercial success of the invention, stating that Philippi-Hagenbuch (assignee) has sold approximately 60 dump bodies designed using the inventive process. The Examiner notes that a picture of a custom designed dump body, in use, was shown during the interview of 11/25/02. The Examiner further notes that custom (point of use, and asymmetric angles of repose) designed dump bodies appear to be an entirely new market (or sub-market), and that these large dump bodies are very expensive items. In view of these facts, the Examiner attaches substantial weight to this secondary consideration, and will keep it in mind while examining this application.

Claim Rejections - 35 USC § 103

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action: A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time

the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

31. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

    Determining the scope and contents of the prior art.

    Ascertaining the differences between the prior art and the claims at issue.

    Resolving the level of ordinary skill in the pertinent art.

    Considering objective evidence present in the application indicating obviousness or nonobviousness.

32. Claims 1-15, 18-26, 28-37, 39-53, and 55-59 are rejected under 35 U.S.C. 103(a) as being unpatentable.

33. Claim 1 (twice amended) is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, p. 1-21, and *In re Rinehart* (Legal Precedent for scaling).

34. Claim 1 (twice amended) is an independent claim with 8 limitations.

35. Note that Hagenbuch US Patent 5,887,914 has a different inventive entity (LeRoy G. Hagenbuch) than the inventive entity of the present application (Leroy G. Hagenbuch and Philip T. Brinkman). Thus, Hagenbuch '914 constitutes 102(e) type prior art that may be used in a 103(a) rejection. Additionally, note that the MPEP 706.02(k) exclusion of 102(e) prior art assigned to the same person does not apply because this application was filed before November 29, 1999 (on June 15, 1999).

36. (c)**"determining a desired location for a load center of gravity"** is disclosed by Hagenbuch '914 at FIG 14A Step 2 "Calculate correct load placement center of gravity".

37. (d)**"determining a desired volumetric capacity for the body"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"

38. (e)**"initial line for a floor..front wall...inside body width"** is disclosed by Hagenbuch '914 at FIG 9A "body floor line", FIG 9B "front slope line", and FIG 10A "inside body width".

39. (g)**"adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location..."** is disclosed by Hagenbuch '914 at FIG 14B Steps 8f "Too far forward" through Step 8m "Move Slope Components Rearward".

40. (h)**"producing the body in accordance with the set of design parameters"** is disclosed by Hagenbuch '914 at FIG 14B Step 9 "DESIGN COMPLETED".
41. Hagenbuch'914 does not appear to explicitly disclose the remaining limitations.
42. (a)**"determining an anticipated point of use for the vehicle"** is disclosed by Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B" and *In re Rinehart* (Legal Precedent for scaling).
43. *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states "mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled". See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.
44. (b)**"collecting data from the anticipated point of use"** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in limitation (a).
45. (f)**"developing a three dimensional volumetric model of a load to be carried in the body..."** is disclosed by Caterpillar Inc. (Release N149F), Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B."
46. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), to modify Hagenbuch'914. One of ordinary skill in the art would have been

motivated to do this to more accurately match the body design to the "loading techniques and material characteristics" by designing based on a smaller and more specific heaped load pattern data set.

47. MOTIVATION ADDITIONAL DISCUSSION—INTIMATELY RELATED PRIOR ART. Note that the Hagenbuch'914 and Caterpillar N149F publications are focused on precisely the same problem, modeling off-road truck loads. Thus, they are intimately related. This intimate relationship goes far beyond the minimum "same field of invention" or "same problem". They are both focused on precisely the same problem in precisely the same field, which strengthens the obviousness rejection.
48. MOTIVATION ADDITIONAL DISCUSSION—SOME IMPLICIT DISCLOSURE. Further, the above rejection states that Hagenbuch'914 "does not appear to explicitly disclose" steps (a) and (b) and (f). However, there appears to be some amount of implicit disclosure of these limitations in Hagenbuch'914, which strengthens the obviousness rejection. Specifically:
49. Step (a) states **"determining an anticipated point of use for the vehicle".** Hagenbuch'914 states "in the working environment of a coal mine... Overburden, which is the earth (rock and dirt) which must be removed in surface coal mining operations to expose the coal seams for mining, typically has a greater density than the coal being mined" at Column 1 line 14. This Hagenbuch'914 statement is very similar to the Caterpillar publication which states "While field weight distribution will vary, depending upon loading techniques and material characteristics" at Page 6. The point is that the Caterpillar prior art has very similar concepts to those disclosed in Hagenbuch'914, and therefore it takes very little motivation to combine them.
50. Similarly, step (b) states **"collecting data from the anticipated point of use".** Hagenbuch'914 states "in the working environment of a coal mine... Overburden, which is the earth (rock and dirt) which must be removed in surface coal mining operations to expose the coal seams for mining, typically has a greater density than the coal being mined" at Column 1 line 14. This Hagenbuch'914 statement is very similar to the Caterpillar publication which states "While field weight distribution will vary, depending upon loading techniques and material characteristics" at Page 6. The point is that the Caterpillar prior art

has very similar concepts to those disclosed in Hagenbuch'914, and therefore it takes very little motivation to combine them. Also note that Caterpillar's term "field" implies making measurements at actual or anticipated points of use.

51. Similarly, step (f) states **"developing a three dimensional volumetric model of a load to be carried in the body..."**. Hagenbuch'914 states "loaded 3:1 heap Light material" and "loaded 2:1 heap Dense material" at FIG 11C. This Hagenbuch'914 statement is very similar to the Caterpillar publication which states "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B." at page 6. The point is that the Caterpillar prior art has very similar concepts to those disclosed in Hagenbuch'914, and therefore it takes very little motivation to combine them.
52. MOTIVATION ADDITIONAL DISCUSSION—*IN RE RINEHART*. Similar to the above discussion, there is a certain amount of implicit disclosure (or at least hinting) in Hagenbuch'914 and in Caterpillar publication towards measuring and designing for a single point of use (scaling). Hagenbuch'914 explicitly distinguishes overburden at a coal mine from the coal seam at a coal mine, and thus explicitly distinguishes between the point above the coal seam and the point in the coal seam. Further, by specifically stating "coal mine", Hagenbuch implies that copper mines may have different densities, and different needs. Coal is a rather unique material to mine because it contains substantial organic matter (hydrocarbons), unlike copper ore in South America.
53. Similarly, Caterpillar explicitly states "depending upon loading techniques and material characteristics" and then (almost apologetically) lumps these different factors into a single 1.7:1 heaped load pattern (instead of the standard SAE model). Thus, Caterpillar appears aware of the importance of loading techniques and material characteristics, and also clearly discloses the inadequacy of using the SAE model when experimental data is available.
54. Thus, the use of *In re Rinehart* for scaling is strongly supported by the rich context of the prior art.

55. **In conclusion, the combination of Hagenbuch'914 and Caterpillar and *In re Rinehart* must be considered in the context of each entire publication, and in the eyes of one of ordinary skill in the art.**
56. Claim 2 depends from Claim 1 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
57. "design parameters of the body includes a position of the body floor and a position of body sidewalls" is disclosed by Hagenbuch '914 at FIG 9A "body floor line" and FIG 10A "inside body width".
58. Claim 3 depends from Claim 2 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
59. **"position of the body floor includes a length of the floor"** is disclosed by Hagenbuch '914 at FIG 14B "Establish maximum overall body dimensions".
60. Claim 4 depends from Claim 2 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
61. **"position of the body sidewalls includes a height of the sidewalls"** is disclosed by "Euclid Inc., Form 12-015 "Euclid R-85 Specifications", 08/77 on Page 4 "the low loading height of 14-4" (4369 mm) allows sufficient clearance to cleanly deposit a full bucket load".
62. Claim 5 depends from Claim 4 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
63. **"distance between the respective sidewalls"** is disclosed by **Form 12-015 "Euclid R-85 Specifications," 08/77** at Page 4 "14'-10" 4521 mm".
64. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use "Euclid Inc., Form 12-015 "Euclid R-85 Specifications" and Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, to modify Hagenbuch '914.
65. Claim 6 depends from Claim 2 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
66. **"position of the body front wall"** is disclosed by **Form 12-015 "Euclid R-85 Specifications," 08/77** at Page 4 in the detailed dimensional drawings.

67. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use "Euclid Inc., Form 12-015 "Euclid R-85 Specifications" and Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, to modify Hagenbuch '914.
68. Claim 7 depends from Claim 4 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
69. **"adjust the length of the body floor and the height of the body sidewalls to provide the lowest practical vertical location for the center of gravity"** is disclosed by Hagenbuch '914 at FIG 14A Step 6b "Dose (sic) trial load center of gravity match correct load center of gravity?" and alternately disclosed by Caterpillar Inc., Brochure AEO26730 "Caterpillar 769 Series B" at page 15 second paragraph "lower the center of gravity of the truck".
70. Claim 8 depends from Claim 1, with one additional limitation.
71. **"data collected from the anticipated point of use includes angles of material repose of an actual load"** is disclosed by Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, at Page 6 second paragraph "While field weight distribution will vary, depending upon loading techniques and mateial characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B".
72. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use RELEASE NO. N149F, TITLE 769 SERIES B TRUCK, DATE AUGUST 24, 1996 to modify Hagenbuch '914.
73. Claim 9 depends from Claim 8, with one additional limitation.
74. **"angles of material repose include a front angle of material repose, a rear angle of material repose and side angles of material repose"** is disclosed by Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, at Page 6 second paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the

769B". Note that this "1.7:1 heaped load pattern" indicates a specific (and constant) angle of repose for front, rear, and sides. Further note that this claim does not specify different angles of material repose. If different angles of material repose were claimed, then this claim would not be anticipated.

75. Claim 10 (amended) depends from Claim 9, with one additional limitation.

76. **the data collected from the anticipated point of use further includes a representation of an actual load carried in an existing vehicle body** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a).

77. Claim 11 (amended) depends from claim 10, with one additional limitation.

78. **the data collected from the anticipated point of use includes angles of material repose and representations of corner voids present in the corners of a plurality of existing vehicles** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a). Note the corner voids are the empty spaces between the load and the truck body. Thus, the voids are inherently defined by the representation of the load.

79. Claim 12 (amended) depends from claim 1, with one additional limitation.

80. **the data collected from the anticipated point of use includes a density of the load material** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a). Note that "actual weight" and "load shapes" (load volumes) are inherently related by the density of the load material. Specifically, weight equals volume times density.

81. Claim 13 (amended) depends from claim 1, with one additional limitation.

82. **the data collected from the anticipated point of use includes a method used for loading material into an existing vehicle body the data collected from the anticipated point of use includes a density of the load material** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a). Note that "depending on loading techniques" inherently discloses both the material providing device (bucket or similar) and the material receiving device (vehicle body).

83. Claim 14 (twice amended) depends from claim 10, with one additional limitation.
84. **developing the three dimensional volumetric load model to account for corner voids in the vehicle body** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a). Note the corner voids are the empty spaces between the load and the truck body. Thus, the voids are inherently defined by the representation of the load.
85. Claim 15 (amended) depends from claim 14, with one additional limitation.
86. **the three dimensional volumetric load model is developed through a gradual incremental blending of the respective side angles of material repose to the front angle of material repose and a gradual incremental blending of the respective side angles of material repose to the rear angle of material repose through respective rounded corners of the three-dimensional model of the hauled material** is disclosed by the well known primitive shape of a cone. The Examiner takes official notice that it is well known in the art that granular material dropped in a large pile from a single fixed discharge point onto a flat surface forms a cone with a single angle of repose. Most children in a sandbox have witnessed this experiment. Thus, a conical load shape is well known. Note that this claim is disclosed by a simple cone because different angles of repose have not been required. If this claim were amended to require different angles of repose, then it would not be disclosed by a simple cone.
87. The Applicant is entitled to traverse the official notice according to MPEP § 2144.03. However, MPEP § 2144.03 further states "See also In re Boon, 439 F.2d 724, 169 USPQ 231 (CCPA 1971) (a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice)." Specifically, In re Boon, 169 USPQ 231, 234 states "as we held in Ahlert, an applicant must be given the opportunity to challenge either the correctness of the fact asserted or the notoriety or repute of the reference cited in support of the assertion. We did not mean to imply by this statement that a bald challenge, with nothing more, would be all that was needed". Further note that 37 CFR § 1.671(c)(3) states "Judicial notice means official notice". Thus, a traversal by the Applicant that is merely "a bald challenge, with nothing more" will be given very little weight.

88. Claim 16 (amended) depends from claim 14, with one additional limitation.

89. **"comparing the three dimensional volumetric load model with the representation of the actual load collected at the anticipated point of use and adjusting the three dimensional volumetric model as necessary such that the three dimensional volumetric load model substantially matches the representation of the actual load collected at the anticipated point of use"** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart.*

90. Caterpillar Inc. (Release N149F), Page 6 first full paragraph states "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B." Thus, Caterpillar discloses a three dimensional volumetric load model substantially matching the actual loads.

91. *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states "mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled". See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.

92. Claim 17 (amended) depends from claim 15, with one additional limitation.

93. This claim is objected to as depending from a rejected claim, but is otherwise allowable because of **"changes in the angles of material repose".** This clearly requires different angles of repose as a function of the orientation (for example, front angle of repose different from side angle of repose).

94. Claim 18 (thrice amended) depends from claim 1, with one additional limitation.

95. **"modeling corner voids of the hauled material into the three dimensional volumetric load model"** is disclosed by Caterpillar Inc. (Release N149F), Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are

actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B." Note that stating a glass is half full inherently discloses that the remainder of the glass is empty (void). Thus, disclosing a load shape inherently discloses the corner voids.

96. Claim 19 depends from Claim 1 with one new limitation, thus is rejected for the same reasons plus these additional reasons.

97. **"adjusting the set of design parameters to provide the lowest practical vertical location for the center of gravity"** is disclosed by Caterpillar Inc., Brochure AE026730 "Caterpillar 769 Series B," Applicants believe available in 1967 at Page 15 second paragraph "The V-shaped bottom of the body also serves to lower the center of gravity of the truck, giving the 769B greater stability.

98. Claim 20 depends from Claim 1 with one new limitation, thus is rejected for the same reasons plus these additional reasons.

99. **"adjusting the set of design parameters to allow material to be loaded into the dump body from the lowest practical vertical location"** is disclosed by Caterpillar Inc., Brochure AE026730 "Caterpillar 769 Series B," Applicants believe available in 1967 at Page 15 first paragraph "Body height is 9'8" (2946 mm) allowing more than a foot (305 mm) of clearance for loading by a Cat 988 Wheel Loader."

100. **Claim 21 is rejected under 35 U.S.C. 103(a)** as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, p. 1-21, and *In re Rinehart* (Legal Precedent for scaling).

101. Claim 21 is an independent claim, with 6 limitations.

102. (a)**"determining a desired location for a load center of gravity"** is disclosed by Hagenbuch '914 at FIG 14A Step 2 "Calculate correct load placement center of gravity".

103. (b)**"determining a desired volumetric capacity for the body"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"

104. (c)"**initial line for a floor..front wall...inside body width"** is disclosed by Hagenbuch '914 at FIG 9A "body floor line", FIG 9B "front slope line", and FIG 10A "inside body width".

105. (d)"**developing a three dimensional volumetric model of a load to be carried in the body..."** is disclosed by Caterpillar Inc. (Release N149F), Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B."

106. (e)"**adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location..."** is disclosed by Hagenbuch '914 at FIG 14B Steps 8f "Too far forward" through Step 8m "Move Slope Components Rearward".

107. (f)"**producing the body in accordance with the set of design parameters"** is disclosed by Hagenbuch '914 at FIG 14B Step 9 "DESIGN COMPLETED".

108. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), to modify Hagenbuch'914. One of ordinary skill in the art would have been motivated to do this to more accurately match the body design to the "loading techniques and material characteristics" by designing based on a smaller and more specific heaped load pattern data set.

109. Claim 22 to claim 26.

110. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.

111. Claim 27 depends from claim 21, with 1 additional limitation.

112. **the data collected from the anticipated point of use includes a front angle of material repose, a rear angle of material repose and side angles of the material repose** is not rejected against any prior art, and would be allowable if it rolled up the limitations of the parent claim 21.

113. Claim 28 depends from claim 21, with 1 additional limitation.

114. **conical shape of an actual load** is disclosed by the well known primitive shape of a cone. The Examiner takes official notice that it is well known in the art that granular material slowly dropped in a large pile from a single fixed discharge point onto a flat surface forms a cone with a single angle of repose. Most children in a sandbox have witnessed this phenomenon. A sand hourglass is another well known example. Thus, a conical load shape is well known. Note that this claim is disclosed by a simple cone because different angles of repose have not been required. If this claim were amended to require different angles of repose, then it would not be disclosed by a simple cone. See claim 17 (amended).

115. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Official Notice (cones) to modify Hagenbuch'914 in order to accurately model loads for granular materials. Note that modern CAD makes the volumetric and center of gravity calculations for truncated cones (truncated by intersections with the dump body) more feasible, rather than being limited to the flat planes of the old standards.

116. Claim 29 depends from claim 21, with 1 additional limitation.

117. **lowest practical vertical location for the center of gravity of the three dimensional model of the hauled material** is disclosed by Caterpillar Inc., Brochure AE026730 "Caterpillar 769 Series B," Applicants believe available in 1967 at Page 15 second paragraph "The V-shaped bottom of the body also serves to lower the center of gravity of the truck, giving the 769B greater stability", and is disclosed by official notice. It is well known in the art that a low center of gravity is more stable (if the other parameters remain constant), and thus preferable for vehicles.

118. Claim 30 depends from claim 21, with 1 additional limitation.

119. **allow the material to be loaded into the dump body from the lowest practical vertical location** is disclosed by Caterpillar Inc., Brochure AE026730 "Caterpillar 769 Series B," Applicants believe available in 1967 at Page 15 first paragraph "Body height is 9'8" (2946 mm) allowing more than a foot (305 mm) of clearance for loading by a Cat 988 Wheel Loader."

120. Claim 31 (new) is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Official Notice (cones).

121. Claim 31 (amended) is an independent claim with 6 limitations.

122. (a)**"determining a desired location for a load center of gravity"** is disclosed by Hagenbuch '914 at FIG 14A Step 2 "Calculate correct load placement center of gravity".

123. (b)**"determining a desired volumetric capacity for the body"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"

124. (c)"**initial line for a floor..front wall...inside body width"** is disclosed by Hagenbuch '914 at FIG 9A "body floor line", FIG 9B "front slope line", and FIG 10A "inside body width".

125. (e)"**adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location..."** is disclosed by Hagenbuch '914 at FIG 14B Steps 8f "Too far forward" through Step 8m "Move Slope Components Rearward".

126. (f)"**producing the body in accordance with the set of design parameters"** is disclosed by Hagenbuch '914 at FIG 14B Step 9 "DESIGN COMPLETED".

127. Hagenbuch'914 does not appear to expressly disclose the remaining limitation.

128. (d)"**three dimensional volumetric load model that includes corner voids"** is disclosed by Caterpillar Inc. (Release N149F), Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B." Note that voids are the empty spaces between the volumetric load model and the walls of the truck. Thus, defining the volumetric load model inherently discloses the voids. For example, defining a glass as half full inherently defines the remaining part of the glass as empty.

129. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) to modify Hagenbuch'914 in order to accurately model loads.

130. Claims 32 to claim 36. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.

131. Claim 37 depends from claim 31, with 1 additional limitation.

132. **the three dimensional volumetric load model is developed through a gradual incremental blending of the respective side angles of material repose to the front angle of material repose and a gradual incremental blending of the respective side angles of material repose to the rear angle of material repose through respective rounded corners of the three-dimensional model of the hauled material** is disclosed by the well known primitive shape of a cone. The Examiner takes official notice that it is well known in the art that granular material dropped in a large pile from a single fixed discharge point onto a flat surface forms a cone with a single angle of repose. Most children in a sandbox have witnessed this experiment. Thus, a conical load shape is well known. Note that this claim is disclosed by a simple cone because different angles of repose have not been required. If this claim were amended to require different angles of repose, then it would not be disclosed by a simple cone.

133. Claim 38 depends from claim 31, with 1 additional limitation.

134. This claim is objected to as depending from a rejected claim, but is otherwise allowable because of **"changes in the angles of material repose".** This clearly requires different angles of repose as a function of the orientation (for example, front angle of repose different from side angle of repose).

135. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Release N149F and *In re Rinehart* (Legal Precedent for scaling).

136. Claim 39 is an independent claim with 6 limitations.

137. (a)**"determining a desired location for a load center of gravity"** is disclosed by Hagenbuch '914 at FIG 14A Step 2 "Calculate correct load placement center of gravity".

138. (b)**"determining a desired volumetric capacity for the body"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"

139. (c)**"initial line for a floor..front wall...inside body width"** is disclosed by Hagenbuch '914 at FIG 9A "body floor line", FIG 9B "front slope line", and FIG 10A "inside body width".

140. (e-part 1)"**adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location...**" is disclosed by Hagenbuch '914 at FIG 14B Steps 8f "Too far forward" through Step 8m "Move Slope Components Rearward".

141. (f)"**producing the body in accordance with the set of design parameters**" is disclosed by Hagenbuch '914 at FIG 14B Step 9 "DESIGN COMPLETED".

142. Hagenbuch'914 does not appear to expressly disclose the remaining limitation.

143. (d)"**three dimensional volumetric model of a load...using data collected from an anticipated point of use**" is disclosed by Caterpillar Release N149F Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B" and *In re Rinehart* (Legal Precedent for scaling).

144. *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states "mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled". See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.

145. (e-part 2)"**material can be loaded into the dump body from the lowest practical vertical location**" is disclosed by Caterpillar Inc., Brochure AE026730 "Caterpillar 769 Series B," Applicants believe available in 1967, at Page 15 first paragraph "Body height is 9'8" (2946 mm) allowing more than a foot (305 mm) of clearance for loading by a Cat 988 Wheel Loader."

146. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Release N149F and Caterpillar AE026730 and *In re Rinehart*

(Legal Precedent for scaling) to modify Hagenbuch'914 in order to accurately model loads for variations in loading techniques and material characteristics, while allowing loading with sufficient clearance.

147. Claims 40 to claim 43.

148. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.

149. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Release N149F and *In re Rinehart* (Legal Precedent for scaling) and *In re Larson* (Legal Precedent for eliminating an element).

150. Claim 44 is an independent claim with 6 limitations.

151. (a)**"determining a desired location for a load center of gravity"** is disclosed by Hagenbuch '914 at FIG 14A Step 2 "Calculate correct load placement center of gravity".

152. (b)**"determining a desired volumetric capacity for the body"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"

153. (c)**"initial line for a floor..front wall...inside body width"** is disclosed by Hagenbuch '914 at FIG 9A "body floor line", FIG 9B "front slope line", and FIG 10A "inside body width".

154. (e)**"adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location..."** is disclosed by Hagenbuch '914 at FIG 14B Steps 8f "Too far forward" through Step 8m "Move Slope Components Rearward".

155. (f)**"producing the body in accordance with the set of design parameters"** is disclosed by Hagenbuch '914 at FIG 14B Step 9 "DESIGN COMPLETED".

156. Hagenbuch'914 does not appear to explicitly disclose the remaining limitations.

157. (d)**"three dimensional volumetric model of a load...using data collected from an anticipated point of use...load plateau at the top of the three dimensional volumetric load model"** is disclosed by Caterpillar Release N149F, and *In re Rinehart* (Legal Precedent for scaling), and *In re Larson* (Legal Precedent for eliminating an element).

158. The "three dimensional volumetric load" is disclosed by Caterpillar Release N149F Page 6 first full paragraph "While field weight distribution will vary, depending upon loading

techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B".

159. The "using data collected from an anticipated point of use" is disclosed by *In re Rinehart* (Legal Precedent for scaling). *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states "mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled". See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.

160. The "load plateau at the top of the three dimensional volumetric load model" is disclosed by *In re Larson* (Legal Precedent for eliminating an element). *In re Larson,* 340 F.2d 965, 144 USPQ 347, 350 (CCPA 1965) states "If this additional features is not desired, it would seem a matter of obvious choice to eliminate it and the function it serves". See MPEP 2144.04(II)(A) "Omission of an Element and Its Function Is Obvious If the Function of the Element Is Not Desired". In this limitation, the "load plateau" is a horizontal plane cutting off the top portion of the volumetric load model (truncation). Thus, the top portion of three dimensional volumetric load model is eliminated, along with its associated volume and mass (volume and mass are the functions that the top portion serves).

161. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling) and *In re Larson* (Legal Precedent for eliminating an element) to modify Hagenbuch'914. One of ordinary skill in the art would have been motivated to do this to more accurately match the body design to the "loading techniques and material characteristics" by designing based on a smaller and more specific heaped load pattern data set, and to truncate the top of the model to more accurately match the actual load. Again,

note that improvements in CAD make it more economically feasible to use slightly more complex models to more accurately model real loads.

162. Claims 45 to claim 51. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.

163. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, p. 1-21, and *In re Rinehart* (Legal Precedent for scaling).

164. Claim 52 is an independent claim with 8 limitations.

165. Note that Claim 52 uses "representative point of use", unlike "anticipated point of use" in Claim 1 (twice amended). However, the same art applies. "Representative point of use" implies a slightly larger scale than "anticipated point of use".

166. (c)**"determining a desired location for a load center of gravity"** is disclosed by Hagenbuch '914 at FIG 14A Step 2 "Calculate correct load placement center of gravity".

167. (d)**"determining a desired volumetric capacity for the body"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"

168. (e)**"initial line for a floor..front wall...inside body width"** is disclosed by Hagenbuch '914 at FIG 9A "body floor line", FIG 9B "front slope line", and FIG 10A "inside body width".

169. (g)**"adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location..."** is disclosed by Hagenbuch '914 at FIG 14B Steps 8f "Too far forward" through Step 8m "Move Slope Components Rearward".

170. (h)**"producing the body in accordance with the set of design parameters"** is disclosed by Hagenbuch '914 at FIG 14B Step 9 "DESIGN COMPLETED".

171. Hagenbuch'914 does not appear to explicitly disclose the remaining limitations.

172. (a)**"determining an representative point of use for the vehicle"** is disclosed by Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of

actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B" and *In re Rinehart* (Legal Precedent for scaling).

173. *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states "mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled". See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.

174. (b)**"collecting data from the representative point of use"** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in limitation (a).

175. (f)**"developing a three dimensional volumetric model of a load to be carried in the body..."** is disclosed by Caterpillar Inc. (Release N149F), Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B."

176. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), to modify Hagenbuch'914. One of ordinary skill in the art would have been motivated to do this to more accurately match the body design to the "loading techniques and material characteristics" by designing based on a smaller and more specific heaped load pattern data set.

177. Claims 53. This claim does not introduce any new limitations, thus is rejected for the same reasons given above for the same limitations.

178. Claim 54 depends from claim 52, with 1 additional limitation.

179. This claim is objected to as depending from a rejected claim, but is otherwise allowable because of **"angles of material repose of an actual load carried in an existing vehicle body".** Note that the plural "angles" explicitly requires measurement of more than one angle, and in the context of the specification implicitly requires front, left, rear, and right angles to be measured.

180. Claims 55 to claim 59. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.

181. MOTIVATION FOR ALL DEPENDENT CLAIMS

182. At the time of the invention, one of ordinary skill in the art would have been motivated to begin with Hagenbuch US Patent 5,887,914 for the fundamentals of volumetric and center of gravity dump body design, then look to industry literature from the industry leading manufacturer (Caterpillar Inc., Release N149F) for factors that affect the center of gravity (loading techniques and material characteristics), then look to Caterpillar AE026730 for body height clearance loading requirements, then look to basic geometry for primitive shapes that more accurately represent the load (cones like sand in an hourglass, and truncated cones), then look to *In re Rinehart* (Legal Precedent for scaling) to more accurately represent the loads by developing models based on smaller (and more specific) sets of data, then look to *In re Larson* (Legal Precedent for eliminating an element) to truncate the tops of the load models to more accurately represent the loads.

183. Note that Caterpillar Inc., Release N149F explicitly states that it is a gross approximation of many measurements, and clearly the sharp edges of the planar load model are an accepted (although undesired) mathematical simplification from the old days when center of gravity calculations were made by slide rule. Thus, limitations in this context related to making customized "point of use" models, or to "rounding edges" stem merely from new economic feasibility due to the advanced power of modern CAD programs, and are not patentable because they are routine expedients according to legal precedent and yield no unexpected results.

184. **Claim 60 (new) is rejected under 35 U.S.C. 103(a)** as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Inc., Product Division, Field

Representative Information Release, N149F "769 Series B Truck," 08/24/66, p. 1-21, and *In re Rinehart* (Legal Precedent for scaling).

185. Claim 60 (new) is an independent claim with 8 limitations.

186. (c)**"determining a desired volumetric capacity for the body"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"

187. (d)**"initial line for a floor..front wall...inside body width"** is disclosed by Hagenbuch '914 at FIG 9A "body floor line", FIG 9B "front slope line", and FIG 10A "inside body width".

188. (f)**"adjusting a set of design parameters of the body until the volumen of the three dimensional volumetric model is substantially similar to the desired volumetric capacity"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"

189. (g)**"producing the body in accordance with the set of design parameters"** is disclosed by Hagenbuch '914 at FIG 14B Step 9 "DESIGN COMPLETED".

190. Hagenbuch'914 does not appear to explicitly disclose the remaining limitations.

191. (a)**"determining an anticipated point of use for the vehicle"** is disclosed by Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B" and *In re Rinehart* (Legal Precedent for scaling).

192. *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states "mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled". See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to

design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.

193. (b)"**collecting data from the anticipated point of use**" is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in limitation (a).

194. (e)"**developing a three dimensional volumetric model of a load to be carried in the body...**" is disclosed by Caterpillar Inc. (Release N149F), Page 6 first full paragraph "While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B."

195. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), to modify Hagenbuch'914. One of ordinary skill in the art would have been motivated to do this to more accurately match the body design to the "loading techniques and material characteristics" by designing based on a smaller and more specific heaped load pattern data set from the anticipated point of use.

Patentable material

196. At present, the Examiner believes that this application contains some potentially patentable material. Specifically, Applicant has observed that front, left, rear, and right side angles of repose are different for material dumped on a truck. This variation is counterintuitive. This variation appears to contradict the well known radially symmetric conical shape formed by sand slowly dropped from a single point in a child's sandbox, or from sand dropped in an hourglass. Additionally, this variation (front, left, rear, right) is contradictory to industry standards for dump bodies, such as SAE J1363 NOV95. The reasons for this variation are complex, and beyond the scope of this examination.

197. The only hint that the Examiner can find of this type of variation or asymmetry is that said standard (SAE J1363 NOV95) uses two angles for the rear portion of the dump: a slope of 1/2 for the top of the rear, and a slope of 1/1 for the bottom of the rear. The reasoning for

using these two angles for the two portions of the rear is not known. Nevertheless, asymmetry of the rear (with respect to the front and/or the sides) is disclosed.

198. **The Examiner has found no prior art where the front angle is different from the side angles (or where one side angle is different from the other side angle), and no legal precedent is applicable.**

199. Note that specification page 11 line 33 states "In most cases, the angles of material repose that run to the front, rear and sides of the dump body will all be somewhat different namely due to natural and impose angles of repose occurring as a result of the loading process". This disclosure is the basis for substantial patentable material. Specifically, asymmetric angles of repose between the front and sides, or between the sides, appears novel.

200. Further note that the recent IDS publications disclose competitors using load models with front asymmetric with respect to the sides, but said publications are not prior art because they are dated after the filing date of the present application.

Conclusion

201. Claims 17 (amended), 27, 38, and 54 appear allowable if they incorporate the limitations of their respective parent claims.

202. The Examiner suggests that a telephone interview would be useful to clarify the potentially patentable subject matter before Applicant submits a Response.

Communication

203. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eduardo Garcia-Otero whose telephone number is 703-305-0857. The examiner can normally be reached on Monday through Thursday from 9:00 AM to 7:00 PM.

204. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin Teska, can be reached at (703) 305-9704. The fax phone numbers for this group are:

205. (703) 746-7238 --- for communications after a Final Rejection has been made;

206. (703) 746-7239 --- for other official communications; and

207. (703) 746-7240 --- for non-official or draft communications.

208. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist, whose telephone number is (703) 305-3900.

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